Estimation Of CA-125 Level In First Trimester Threatened Abortion

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Abstract

Objective: Serum level of CA-125 turned out to be a valuable parameter not only as a marker of ovarian carcinoma but also in other fields of obstetrics and gynecology. Earlier work suggested that highest level of CA-125 could be detected in the sera of women with threatened abortion. Design
: A prospective study.

Setting: Private hospital and clinics in Baghdad.
Subjects: The study population comprised of 42 pregnant women who were recruited from August 2004 to September 2007 and had a vaginal bleeding in the first trimester ending in abortion. The controls were 20 pregnant women who had normal pregnancy without complications. Intervention: Blood was collected and level of CA-125 antigens (Ags) was estimated in the serum of these women by Enzyme Linked Immuno Sorbent Assay (ELISA) in Immunological laboratories in Central Public Health Laboratories and Teaching Laboratories in Medical city in Baghdad. Ultrasound confirmation of fetal heart activity was done. Main outcome measure: Pregnancy outcome and CA-125 level in the serum.
RESULTS: In spite of increased level of CA-125 in aborted patients in first trimester. There was no significant difference between two groups.
CONCLUSIONS: CA-125 can not be used as a predictor of outcome of early pregnancy complicated by vaginal bleeding

INTRODUCTION

Spontaneous abortion is one of most common complication of pregnancy. The diagnosis of spontaneous abortion currently depends on a combination of ultrasonography and nine hormonal methods (serum human chorionic gonadotropin (HCG), estradiol (E2), estrone, estriol, progesterone, human placental lactogen, cortisol, urine HCG and urine estrogen (1).

Another parameter used as a predictive marker for a spontaneous abortion or subsequent outcome of pregnancy is Cancer Antigen-125 (CA-125). This antigen is a cell surface high molecular weight glycoprotein; synthesis is not restricted to malignant transformation and ovarian tumors (2,3). It is also expressed in normal tissues such as endometrium, endocervix, fallopian tubes, and mesothelial cells lining adult plura, pericardium and peritoneum (4). There is a cyclic changes in the serum concentration of CA-125 in normal menstruating women seems that it's a product of normal endometrium (5). In other reports, it was suggested that ovaries were the main source of CA-125 (6). Generation of potential immunogenic peptide (YTLDrDSLYV) derived from CA-125 that bind to human leukocyte antigen (HLA A2,1) leading to elicit peptide – specific human cytotoxic T lymphocytes that effectively kill ovarian tumors expressing CA-125 antigen (7).

During pregnancy, CA-125 was presented in tissues derived from embryonic coelomic epithelium (8) and through out gestation, significant quantities seen in the deciduas and chorion which is the main source of it (9). CA-125 had been found in high concentration in human amniotic fluid and the amnion was a major source of it (10).

During pregnancy, disruption of the epithelial basement membrane of the fetus membrane or disruption of the decidua could theoretically leads to a rise in the maternal serum CA-125 level; this increase may be a predictor of subsequent spontaneous abortion of the fetus (11).

A study was initiated to investigate a rise in the serum

CA-125 level might predict spontaneous abortion or ongoing pregnancy in pregnant women with vaginal bleeding in first trimester and compare it with normal pregnant Iraqi women.

MATERIALS AND METHODS

The study population comprised of 42 Iraqi pregnant women who had vaginal bleeding in first trimester ended with abortion confirmed by ultrasound and some of them dilatation and curettage done for them. The women were recruited from private hospitals and clinics in baghdad from August 2004 to September 2007. Gestational ages were calculated according to the last menstrual period confirmed by ultrasound.

The control group comprised 20 pregnant women who had normal pregnancy in first trimester and who had continued their pregnancy confirmed by antenatal care and follow–up.

Maternal blood samples were taken in the first trimester and the serum was separated and measurement of CA-125 was done in the Central Public Health - Department of Immunology and Teaching Laboratories – Department of Immunology in Baghdad using Enzyme Linked Immuno Sorbent Assay (ELISA).

STATISTICAL ANALYSIS

Data was expressed as mean ± SEM. Statistical analysis was done using student t-test.

RESULTS

Forty-two pregnant women were recruited for this study. Their ages ranged from 16-33 years old (mean 23 years), gravidity ranged (1 - 6) (mean 2.51). Number of previous abortions were (0-3) (mean 0.55). All of them were not smoker.

While the measurement of CA-125 showed higher mean value for the group that ended with abortion, there was no significant difference between two groups as shown in Table 1.

Figure 1

Table 1. Level of CA-125 in the serum of pregnant women expressed as mean ± standard error mean.

Test	Group I End with abortion n=42	Group II Normal pregnancy n=20
Serum Ca-125 Cut-off value up to 30 IU/ml	39.9±15.4	28.03±4.5
p-value	N .S.	N.S.

DISCUSSION

The ultrasound, serum -HCG and progesterone titers are widely used to assess the risk of miscarriage at the early stages of pregnancy (12). They are not considered as satisfactorily sensitive tests during the first three months of pregnancy, therefore their value is limited. Evaluation of serum levels of CA-125 antigens has been considered as a useful marker in diagnosis and monitoring of some ovarian carcinoma (13) but there are some studies suggesting its predictive value when estimating the risk of miscarriage at early stages of pregnancy (14). Women with threaten abortion revealed higher values of serum CA-125 antigen than those in the control group and those patients who had presented the highest values of the antigen later miscarried (15). This high level is likely due to tropho-decidual origin of this marker and invasion of deciduas by chorionic villi. This decidual disruption is associated with vaginal bleeding (16-17).

Our results showed no significant difference between groups I who end with abortion and group II that had ongoing pregnancy in spite of its higher values 39.9±15.4 . Our results were in agreement with Hornstein et al 1995 (18) and Vavilis et al 2001(19), who found that there was no statistically significant difference in CA-125 levels of patients who aborted compared with those women that continued pregnancies. Poliklinik et al 2000(20) was in agreement with our results who reported that CA-125 could not serve as an accurate predictor of pregnancy outcome due to the wide overlap of the ranges.

However, there are also contradictory reports which showed that it may be useful. Some reports demonstrated the prognostic significance of the maternal serum CA-125 measurement in the threatened abortion because it

determined the extent of decidual destruction which is directly related to the outcome of pregnancy and its usefulness in predicting early abortion (20, 21). One report showed that all patients who eventually aborted had values of CA-125 more than 125IU/ml while the control had a value not more than 93 IU/ml (22).

One report showed the distribution of CA-125 during pregnancy was highest in first trimester than second and third trimester (5, 9, and 11). This may be due to the secretion of CA-125 and placenta protein 14 (PP14) by the glandular epithelium of the endometrium (5,23). Serum concentration of these parameters may increase during the first trimester of pregnancy as the concentration of progesterone rise to a maximum in the first trimester (24). This observation suggest that CA-125 is synthesized by normal endometrium in non pregnant female and by deciduas in pregnant women (25).

An observation that suggest CA-125 correlates less well with endometrial development in women suffering from recurrent miscarriage (26). One report demonstrated that concentration of CA-125 in the pregnant women who subsequently aborted were higher than those who did not, thus suggesting that serum CA-125 are not so important in maintaining successful pregnancy (27). CA-125 may be useful in the assessment of endometrial development in recurrent miscarriage patients and this suggested the importance in preparing the endometrium for embryo implantation (28). High level of serum CA-125 with high lactate dehydrogenase indicates more extensive trophoblastic tissue damage (29).

Some found that single serum CA-125 level determinations is valuable in women with imminent abortion presenting with abdominal pain, vaginal bleeding or both (30,31). Our results are in disagreement. In our opinion this may possibly be attributed to the method of CA-125 measurement. In above reports used radioimmunoassay while we used enzyme immune sorbent assay method.

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